Pocket Notebook
PN 28-02-10 (1927-1928)

This notebook dates from November 1927 - March 1928. The pocket notebook contains notes by Thomas A. Edison relating to rubber research. There are descriptions of plants and lists of ordered plants.

Feb. 10, 1928 ☆3346

12/24/1929
Copied all except marked out parts
typewritten sheets 1 to 11 (E)

EDIS 223931

Lab - Ft Myers

~~A water Still for making distilled water~~

~~A local heating outfit same as we heat our bath water to be put up at Lab Ft M~~

~~According to weather reports in Ft Myers paper Rain ceased Nov 5 none since now 9th guess its end of rainy season~~

Lamia-ceae [Small]
Labiatae [Juss]

43 Genera.

183 species described by Small

68 are in Florida and described by Small

They are herbs or shrubby plants FOUR SIDED STEMS
Rarely Trees —
Aromatic — vegitative parts abound in volitile oil & a bitter principle

Leaves opposite or whirled

Blades simple, entire or variously toothed, lobed, or cleft.

Flowers perfect, irregular or nearly regular

Fruit usually of four small nutlets or achenes included in the persistent calyx

Seeds solitary erect

Make drawing diagramaly of the various stems & flowers to be found in fla following heights

56 — 20" — 12 — 85 — 16 — 40 — 24 — 16 — 16 — 24
12 — 16 — 12 — 36 — 20 — 24 — 40 — 36 — 60 —
60 — 80 — 16 — 36 — 48 — 16 — 28 — 40 — 28
28 — 72 — 12 — 24 — 48 — 40 — 32 — 16 — 24
24 — 16 — 28 — 24 — 16 — 36 — 24 — 28 — 16
16 — 28 — 32 — 40 — 48 — 24 — 40 — 36 — 24
20 — 24 — 32 — 72 — 48 — 75 — 36

15 over 40" high

Prevailing Color of flowers
Blue, Purple pink = than seldom
White Comparatively + yellow
seldom -

Smalls Colors of the Flower
of Lamiceae Mint family

White 6 - Pink 14 - Rose purple 2
Pink Purple 4 Blue + Lilac 2
Redpurple 1 — White or blue 2
Blue 33 — White pink blue or purple
2 - blue pink or white 1
= Blue or purple 5 = Blue or white
6 = yellow or purplish 1
= purple 6 = Pale - 2 -
Purplish or white 6 =
Yellow Scarlet or Orange 1
Purple 11 - Red + Scarlet 2
Scarlet 4 Crimson 1

Purple blue 1 - green or Cream
Color 1 = Red purple 1
Lilac or purplish 1 = White or
Purple 2 Magenta 1
Lilac 3 = green purple 1
Tawney 1

Very few white in all

Verbenacea very much
like Lamenaceae
Verbenacea has stems
Commonly 4 angled

Verbina Corolla White
or Various Colors etc
next to Mint family in
Smalls book.
apparently flowers blue
etc pink

leaves alternate
rarely opposite or whorled

~~We possibly will have to~~
~~Cut most plants before~~
~~seed is ripe + plunge into~~
~~boiling water as soon~~
~~as Cut to Coagulate~~
~~remove all the water~~
~~sol stuff + then~~
~~dry quickly — to~~
~~get best % of rubber~~

~~Possibly pressed before~~
~~pulling possibly Cut~~
~~+ put in a pressure~~
~~or autoclave at~~
~~30 or 40 lbs steam~~

~~Rhinanthaceae~~

~~Terete stems — find~~
~~what this means~~

~~Its next to Lamiaceae~~

~~+ Colors are like as~~
~~to flowers study it~~

~~Figwort family~~

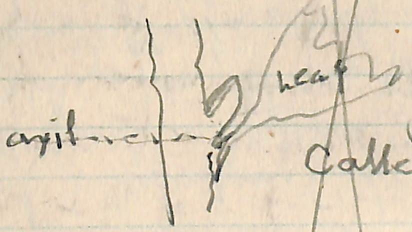
~~Leaves opposite sometimes~~
~~whorled —~~

~~fruit a 2 valved Capsule~~
~~seeds usually numerous~~

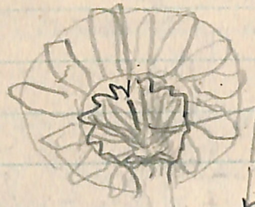
Phanerogams. cover all seed plants –

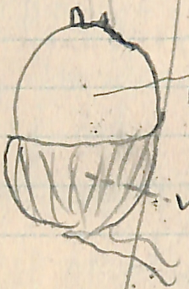
Highest type of seed plants Angiosperms.

Flower buds + leaf buds are produced in the axil of the leaves.

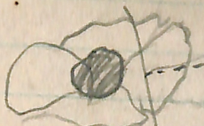


Called bracts


Bracts
or involucre
in Compositae


oak seed
involucre

OVER


involucre or bracht
of Hazel nut

A sheathing bracht enclosing 1 or several flowers is called a Spathe it protects the young flower, + falls off after the, bunch of flowers of the palm emerges + turns into seeds – ~~th~~ in this case its Called Spadix

The whole bunch is Called inflorescence, as in Dandelion

copy fig 4 – under flower Ency Brittanica

Pendeculs stem bearing a single flower as in Primrose

wrong ende up

Copy Fig 11 Ency Brittanica
ditto Fig 12 ditto fig 13
ditto 15 fig

petals 4

Copy

Oil of Turpentine Combines with HCl to form a crystaline product + water under certain conditions form a hydrate.

Perhaps the terpins from Lamiaceae cuttings can be heated + the volatile oil saved by condensing + afterwards the Rubber produced

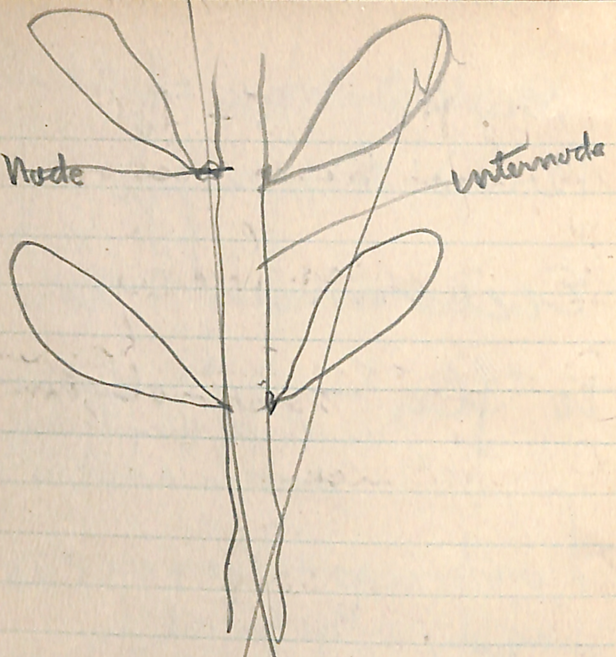
↑ Bye Produce ↑

Ask Brown of Albany
Bred Cuttings from
Eucommia & Kent
to Fla — yrs-old wood
no starch, they leaved then
died in sand in 9 Hour

Look up Buxaceae
family - related to
Celastraceae & Empetraceae
Boxwood
More directly to Euphorbiaceae

Aquifoliaceae
Holly
related to Celastraceae

Stackhousiaceae
related closely to Celastrineae



~~Hand go to house & Collect the Honeysuckle black berries~~

It is curious that Apocyans & Laminacea [Labiatae] both have creeping roots & Rubber

Up to Nov 15 - following families have rubber

Papaveraceae (poppy)

Celastracea Species Scandens + other [illegible], Euonymus Mackii

Gentianacea -

Apocyanacea

Asclepiadacea

Labiatae [Mint]

Caprifoliaceae Honeysuckle

Lobeliaceae (probably)

Cichoriaceae

Compositaceae } ⑨ families

Euphorbiacea possibly

Eucommia -

Garryale -
Later Feby 10/28
Verbenaceae
Amarillidaceae
Rubriaceae
Aquafoliaceae
Sapotaceae
Myrtaceae
Terminalaceae
Bignoniaceae
Hydrangaceae
Geranaceae
Vaccinaceae
Genitanaceae
Scrophulaceae
Lobeliaceae
Ambrosiaceae

Up to Feby 10
1928
26 families

Giant Golden rod
5½ ft high - Dry weighs 18.5 grms If 8 can be grown in a square ft well give 148 grms per foot 42000 ft in acre gives 13813 lbs or 6.97 Tons per acre.

Its a very light hollow cane about 4 @ 5½ dia -

~~Sec of Anhydrous KOH or NaOH. Sol in Ethylene Dichloride not sol apparently~~

Koellia Virgiana

~~.51 Crude .37 purified Sticky - may have rubber. will work in Ball Mill~~

~~Koellia Flexuosa - No 79~~

~~.65 Crude .63 purified as good as best Guayule. should be pressed to bring out full strength - perhaps some specs not yet.~~

Have Rubber

Order 28 Urticales

Ulmaceae.
Moraceal
Urticaceae

Order 38 Geraniales
Geraniaceae
Oxalidaceae
Tropaeolaceae
Linaceae
Erythroxylacea
Zygophyllacea
Rutaceae
Simaraubceae
Burseraceae
Meliaceae —
Malpighiaceae
Tremandracea
Polygalaceae
Euphorbiacea —

Order 39 Sapindales

Buxaceae
Empetraceae
Coriariaceae
Limnanthaceae
Anacardiacea
Cyrillaceae
Aquafoliacea
Celastraceae ←
Stackhousiaceae
Staphyleaceae -
Aceraceae
Hippocastanaceae
Sapindaceae
Melianthaceae —
Balsaminaceae

Order 48 Ebenales

Sapotaceae
Ebenaceae
Styracaceae
Symplocaceae

Order 49 Contortae

Oleaceae
Loganiacea
Gentianacea
Apocynaceae ←
Asclepiadacea ←

Order 50 Tubiflorae

Convolvulaceae
Polemoniacea
Hydrophyllaceae
Boraginacea
Verbenacea
Libiatae ←
Nolanceae
Solanceae
Scrophulariacea +
Bignoniacea
Pedaliaceae
Martyniaceae [illegible]
Gesneriaceae

Order 53 Campanulas

Cucurbitacea
Campanulaceae
Compositaceae ←

57

Order 52 Rubiales

Caprifoliacea. R
Honeysuckle,
Valeriancea
Dipsaceae

Bignoniaceae family
Contains the Honeysuckle.
100 genera 400 species

over

Small button of rubbery
stuff from John C Herr
940 Gladys Ave Long
Beach California
its low grade rubber;
See letter & inform him.

Caprifoliacea is the
true Honeysuckle family
11 genera 350 species
mostly in N Temperate Zone
Closely Related to
Rubiacea, has Rubber
Cornacea
Valerianaceae

Bignoniaceae

20 genera cultivated in
USA.
Trumpet Vine got Rubber
Cross Vine.
Catalpa - hardy tree
Desert Willow (Chilopsis)
Flowering willow
Calabash tree (Crescentia)
Trumpet Creeper T Vine is
the Honeysuckle
Yellow Elder Tecoma
Pandorea (wonga-wonga Vine)
Bower plant Australia
Tecomaria (Cape Honeysuckle)
All cultivated mostly
in the South only
1 only fully hardy
in the North

Schmerka to exhaust
15 grams of a rubber
Vine With Acetone then
with Ethylene Dichloride
finally distill all
E Dichl off + get loss

ditto, use water +
distil off E Dichl
+ see if this reduces
loss –

ditto blow air thru
the mix + then thru
Straw oil Etc to
absorb E Dichl
+ get loss

Schmerka Another Expt
Exhaust Celastraceae
without Acetone – ~~if it~~
using E Dichlor. If no
resin we can use it
alone, Eucommia also

Benny took several
stems of different plants
Washed them in small
drop press perhaps 50 lb
Hammer 3 to 4" drop

then cut them in inch
lengths & put in water
ordinary temperature
3rd day not soft
enough but on 5 @ 6
days all water logged
& soft enough but
Saldugo took 10 days
bark very thin on the
but none OK —

Bark will no doubt
come off with
just half full
porcelain balls

Think 1/2" lengths
be much quicker

~~for all plants, woody~~
~~ones Exhaust them like~~
~~Soldago hardest~~

~~Dont think well need~~
~~warm water -~~

over
60 species of Soldago
occur in NE USA

in the World there are 130
species of Soldago (golden Rod)

~~Benny must get drying~~
~~oven for 20 mesh test stiff~~
~~light - Ice box~~
~~get at Myers~~

~~Staphylea - Staphyleacea~~
~~formerly Celastracea (in that~~
~~Order)~~
~~All OK in Mass probably have~~
~~Euonymus rubber~~
~~Deciduous shrubs or small trees~~
~~Eleven species in temp zone~~
~~of US. 6 ft 15 ft 15 ft 25 ft~~
~~+ so on -~~

Over
Last year Florida average
of lbs. of Cotton per
acre 121 lbs
at 19 cents

121
19
1089
121
2299

practically
$23 00

Nov 16/27

~~Perhaps fine ground bark~~
~~with agitator & small quantity~~
~~of rubber solvent insol & floating~~
~~in water will help rubber~~
~~in pore veins to float to the~~
~~top & accumulate —~~
~~Oil need not be a solvent but~~
~~a swellor or protector of~~
~~tackiness~~
~~perhaps Emulsions then~~
~~allowed to come to top —~~
~~skimmed & fresh oil put~~
~~in, Rubber & oil put~~
~~in a solvent of oil that~~
~~will not dissolve rubber~~
~~& thus be separated —~~

~~Possibly as soon as~~
~~plants cut they should~~
~~be brought to 212° in~~
~~boiling water to kill~~
~~fungi & bacteria & ferments~~
~~then dried to 15% water~~
~~Crushed or cut in lengths~~
~~& water logged or not~~
~~& Debarked~~

~~It may be a floatation~~
~~process can be used~~
~~Certain oils etc to be~~
~~found especially may~~
~~not wet waterlogged~~
~~bark or pith but will~~
~~wet rubber or vice versa~~

Cohen

I am wondering if

Methylene dichloride may not be a good solvent of Rubber & not a solvent of Saponifiable resins

Also if Methyl Chl BP 45°C isnt a solvent it has Merit of very low B.P.

Acetylene dichloride
Ethylene mono or dichl
Amylene " "
Butylene " "
Decylene " "
Hexylene " "
Propylene " "

After bark ground free see Lime & also see about deflocculating

Perhaps bark treated with Lime — ditto Sulfite Lime with or without pressure

As long as bark dont flake when thick can use Drum & only film & scrape off

---

Experiments show that when Dry brittle giant golden rod is crushed to ½ long is soaked in Water 1900 cc 45 grams 3 days 90% sink, 10% that dont sink are mostly small stems that escaped crushing When 45 grms & 9 lbs 1½" porcelain ~~balls~~ 1000 cc water is put in ball Mill 1 hour the bark is all removed but

when passed a 10 mesh screen
a large number of broken
wood splints get into bark
8 lbs is too heavy for
the brittle friable wood

I think the wood itself
will rub bark off itself
when put in Mill
if not 1/8 or 3/16 crushed
quartz will do it without
grinding wood or splintering
it

Fred Ott get 10 lbs
quartz pebbles ~~and~~
Crush to 1/4" for
Ball Mill Expts on
debarking

Try experiment with
45 grams golden rod
water logged 5 days
but only use just
Enough water to cover
it put in ball Mill
for debarking

John Miller - you know
Schwenka orders & your
set all Chemicals for
Phono Ota Disc Storage
battery You will have
to do this Hart can
give them aid on your
order & you can order
fresh supplies

We should try cutting plant
& crushing & crushing green
and rapid debarking at
200° fahr
also cutting green squeeze
debark then drying bark
quickly to coagulate
proteids & kill bacteria
etc — Then bark ground
fine in water —

Try SO_2 water weak
for soak in debarking

ditto Chl Zn

Get bulk of 15 grms of
average material in
Soxhlet,
Compress some see how
reduce bulk
ditto wet then dry & see
if it holds shape the sol
muck & pectin acting as
binder if ok test for
rubber

Value of Crops per Acre
1909

Flowers	1.910
Small fruits	110
Potatoes	45
Vegetables	78
Cereals	14 → $75.—
Hay	11
Tobacco	80
Cotton	26
Sugar beets	54
" cane	55

Look out for Ericacea
Heath family –
~~Has~~ Genus Azalea has
2 species
Azalea nudiflora
Wild Honeysuckle

Azalea Viscosa
Swamp honeysuckle

both found in Fla –

All the Azaleas high (4)
Rhododendron is a
Ericaceae – Laurel

See Meadowcroft that he
gets all the formula
from Hart –

Diervilla Hortensis Gratissima

Has rubber pretty good
yield .69 Conde
What family
(Caprifoliacie)

On Osborns list of Nov 28/27
following families have
Rubber
Papaveracea 1
Cruciferae 1 – in doubt
√ Hydrangaceae 1 – good
Grossulariacea 1 in doubt
√ Geraniaceae 1
√ Euphorbiaceae 1
√ Celastraceae 1
√ Vacciniaceae 1 in doubt
√ Gentianaceae 1
Apocynacea 2
Asclepiadacea 3
Labiatae several

Scrophulariaceae	1	doubtful
Caprifoliaceae	6	
Lobeliaceae	1	Doubtful
Cichoriaceae	many	
Ambrosiaceae	1. another doubtful	
Compositaceae	Many	

19 families

Have Carnahan send me 20 lbs of tailings from Gamyuld, just as it comes don't try to make a good specimen

Look at small pot I got up that Payne reduced iron was not pyrophorous

Add to ~~15~~ 100 grams of bark pulp from debarking enough Hevea latex to equal .75 rubber then add a little acid to precip it, mix well then ~~[illegible]~~ grind to globulate see how much rubber can get out by flaking process ~~Can make 100 or more respect ones - so as to get supply~~ Can split the 100 grams in 2 or 3 doses to work various ways

5

~~When get Florida collect all the water sol cherry gum from that tree near the Pineapple bed.~~

~~If this is treated hot with Formaldehyde it becomes insoluble in water might have a Commercial use.~~

~~Out of the 301 plants received from Arnold Aboratum consisting of many families on 4 families showed rubber 69 plants Total~~

~~50 were species of Caprifoliacea~~
~~14 Hydrangeacae~~
~~2 Compositae~~
~~1 Vacciniaceae~~

Cop

From Bureau Agriculture
Wm Butler

Number cotton plants per acre 10 000

average product of Cotton per acre 151.2 lbs

under exceptional Condition by irrigation the yield in some localities have reached 2 bales 1000 lbs or 6 times, showing possibilities

151 lbs is 67950 grams

with 10 000 plants this gives 6.79 grams per plant

Dec 12/27 ←

Following families have RUBBER

Lobeliaceae	NJ	126
Scrophularaceae	"	395
Caprifoliaceae		
Cichoriaceae		
Ambrosiaceae	NJ	42
Compositae		
Grossulariaceae	NJ	246
Balsamnaceae*	NJ	198
Genetianacea	NJ	166
Viccinaceae	NJ	172
Apocyanacea		
Asclepiaceae		
Labiaceae		
Hydrangeaceae		
Celastraceae		
Papaveraceae	NJ	156
Euphorbaceae		

17

9 sure
8 uncertain

* Gray say Geraniaceae

additions

Solanaceae.

Chenapodiaceae good Rubber

	Cond.	Pfd
apocynum androsaefolium	47	38
Asclepias Pulchra	41	28
Koellia Flexiosa	65	63
Koellia Virginiana	51	37
Lactuca Spicata	52	29
Sonchus Oleraceous	29	16
Xanthium Commune	42	17
Eupatorium purpureum	25	21
Solidago Canadensis	49	37
" Caesia	27	21
Hall Lonicera Japonica	75	73

Lycopersicon Lycopersicon Tomato
Eggplant "
Both probably have rubber

Copy

Millimeter	039	inches
Centimeter	393	"
Decimeter	3.937	"
Meter	39.370	"

~~Dec 18/27~~

~~Payne should try 800°~~
~~7 and 15 hours.~~
~~If nearly OK should increase~~
~~the CaCl + H_2SO_4 surface~~
~~if OK reduce lamp to~~
~~750° 7 + 20 hours~~

~~+ then if OK, reverse~~
~~direction of H + make it~~
~~10 hours 1 way + 10 hours~~
~~the other way~~

~~GVM write Va NC SC~~
~~Ga, Ala if there is any~~
~~publication of the~~
~~flora of these states~~

~~Get address of state~~
~~agricultural College~~
~~+ one with secy~~
~~of state or Governor~~

I think perhaps the material
obtained from Evonymus or
Encomena trees could be
made into Artificial
Silk alone or in Mixtures

Took stem of Halls Jap
Honeysuckle leaves on
it was last 10" of the
stem, separated leaves
from stem, weighed
them separately

	Grams
Weight stem	1.341
Weight leaves	1.872

Dec 19/27

leaves	58.2%
stem	41.8

Sent them to 1.39. parts

~~See Schmerka book 12~~
~~for water in stems &~~
~~Leaves of Halls Jap honeysuckle~~
~~Cut off Dec 20th~~
~~Dried all night 110° F~~
~~32.5% water came off~~
~~leaves 41.4% "~~
~~from stems, Stems cut up~~
~~fine by knife~~

~~Original weight not dried~~

~~Leaves~~	~~1.872~~	~~58.2%~~
~~Stems~~	~~1.341~~	~~41.8%~~

~~Equals 1.39 parts leaves~~
~~100 " Stems~~

~~Should dry Rubber~~
~~Milk that dont give~~
~~Rubber Milk used~~
~~Euphorbia etc~~
~~dissolve in solvent~~
~~which will give~~
~~2 to 3 % Chloride~~
~~of sulphur~~

~~Order 2 or 3 lbs~~
~~Chloride of sulphur~~
~~sent to Ft Myers~~

~~See Capt E E Damkohler~~
~~2114 Hough St.~~
~~Ft Myers guide to~~
~~1000 Islands Everglades etc~~
~~want job - see him in~~
~~Ft Myers -~~

When arrive Fla plant
ordinary Milk weed 1 to ft
2 3 4 5 6 to a ft
plant 100 of each –

ditto Hydrangea
Koella
Honeysuckle Japanese
in several ways –
also seeds from Henderson

Try yield + quality of
Euonymus with Trichl-Ethylene
Bisulfide Carbon Petroleum
Ether, Ether, Gasoline, etc

ditto Halls Honeysuckle
+ others,

Write the party living at
Moss Point Miss also Roses
letter states has sent seeds
of the Manihot, 5 miles from
Gulf Lat 30° ask if more
than 1 shoots springs
up after frost

Boiling leaves in
Caustic Soda dissolving
out filling matter

+ Recovery of soda
by burning is to
be considered

Lots of Halls Honeysuckle
Havre de grace
Southward
More quantity at
Quantico south of
Washington -
seems to like low
places but that may
be due to carrying
of seeds.

Possibly a stamp
Mill will be best
to Eliminate fibres
from leaves +
bark

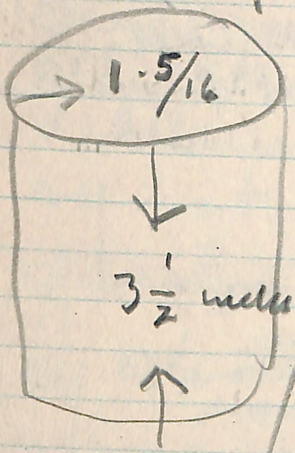
For picking leaves
when dormant a
disk or discs handled
by a universal rod
face full $\frac{1}{32}$ taken
with Guedion
Move rod to leaves
they meet the flat
discs are held against
it.

~~Dichlor Ethylene~~
~~followed by displacing~~
~~cheapest gasoline~~
~~etc followed by~~
~~distilling followed~~
~~by hot vapor of~~
~~gasoline followed~~
~~by steam —~~

~~Saw 15 miles below~~
~~Jacksonville Orange~~
~~tree loaded with~~
~~oranges but most of~~
~~leaves frost bitten~~

Ask Small about Acnida
"Careless" — pig weed —
12 ft high 12" dia single season

Brass Cup on Hexbolt



3 x 6" 21 hrs
21
21
21
42
441
96
96
576
864
9216
441)9216
882
39

1.3
1.3
39
13
1.69
4.
441|1.6
15
21
15
30
315 grains
16
7
112

Glaziovii seeds in
Ammonia 1 gram 120·7

Tapioca mixed with
ammonia

Tapioca mixed with
Carb Soda

Reg water with Copper
to make Cupric ammonia
120·7

Irrigation 8 acres

Once weekly for 32 weeks
336 000 Sqr feet [Cubic]
48.000 000 Cubic inches
1.792 000 lbs

896 Tons per week
127 " daily

Will give 2000 tons daily
of clear

Ditch as in 300 ft

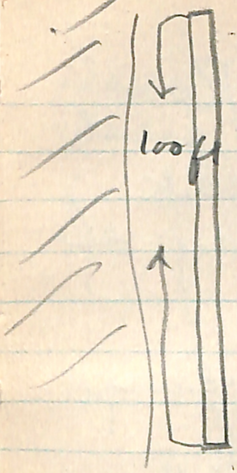
50 minute with

Nut full hydrant

~~Carnahan~~

~~Spence~~

~~Top of lot~~



~~took 2 min to reach end 100 ft~~

~~all dry in 21 min~~

~~about 2 ft wide at start tapering to 15 inches 4" deep =~~

Oleander in Row
next to Lab 3rd bush
from Central walk
Stripped entirely of
Leaves —

Diameter of foliage
6 ft. height of
Foliage 6 ft 6"

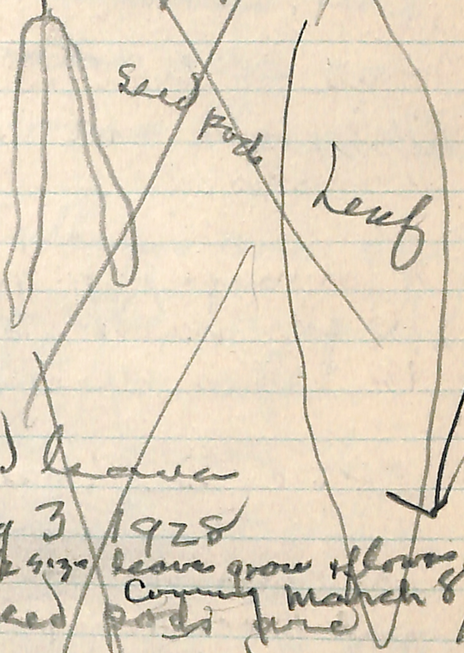
Base 2½ ft dia

Largest stem 1½"
at bottom Mostly
½ @ ¾ —

only branches at top

leaves cling badly
Cant strip have to
pull Each leaf
Later March 8th 1928
#3 Bush all leaved again leaves
½ full size + one shoot in flowers

Seed is Asparagus



Striped leaves
Feby 3 1928
All ½ size leaves grow + flowers
Coming March 8/28
The seed pods are
brown opened + nearly
all seeds gone
fine hairs for wind
Spreading —

We pull every leaf from
the plant to see if the
plant will Refoliate
+ how soon OK 32 days

~~I planted Cuttings~~
~~about foot long in~~
~~rows about 15" apart~~
~~End but put down in~~
~~Moist sand in old~~
~~garden about 20~~
~~Cutting 1/2 To 1 1/4~~
~~dia didnt [illegible]~~

~~twigs, Cuttings are~~
~~about same age as~~
~~California Poinsetta~~
~~These Cuttings are only~~
~~4 days old, Tamped~~
~~by foot, & after~~
~~planting gave the~~
~~roots plenty water~~
~~Feby 3rd 1928~~

~~In flora of alabama~~
~~Trumphet Vine growing~~
~~luxuriantly 30 miles~~
~~up the Tombigbee River~~
~~yellow Jessamine~~
~~Trumphet Vine widely distributed~~
~~Carolina west~~

Apocyanaceae

Amsonia, Nehling speaks of it grows NC to Fla

Its Tabernmontana

find out foliage see if St Marys or Oneco or Nehling has them–

Recd from Calif –
Fresno Nursery

6 plants

1	Kadota	Feby 3
1	Black Mission	
1	Capri	
1	Capri 3	
1	Capri 1	
1	Colingera	
1	Adriatic (White)	

Roots on 36 inches high
1/2 to 3/4 stem dia

Planted Feby 8 – 7 x 7
square ft allowed –
Fig trees or bush trees

Up to Feby 10 we have found rubber in 7

new families

Verbenacea	1	Vervain family
Amaryllidaceae	1	Amaryllis family
Rubiacea	III	Madder family
Aquafoliaceae	II	Holly family
Sapotaceae	II	
Myrtaceae	1	
Terminaliaceae	1	white mangrove family

Described in Smalls book

Verbenaceae 14 genera -

genus - Verbena 23 species alone
of the 23 11 are perennial 7
annual height 16 24 36 48
+ 60" most all the other genus
are tall -

The Mint family is next &
after Vervain family - Think
there is good show for us
in Verbenaceae

Myrtaceae

Myrtle family - 4 genus
Shrubs Trees, rarely herbs
pungent aromatic oil -

genus Eugenia all trees
18 ft to 54 ft
genus Anamomis 24 ft
2 other genus trees,
all found in Southern Fla &
Keys & W I

Rubiaceae

Madder family 24 genus
Herbs, shrubs, or trees
Nearly all low

got Rubb

Aquifoliaceae got Rubb

Holly family

14 genus got Rubb

genus Ilex - glabra has rubber, shrub 4 1/2
Hardy north, its evergreen,
Ilex has 14 species trees & shrubs
only genus in Smalls book
(1e) genus Ilex - everyone described
is a tree except the shrub Ilex
glaba which is a shrub & from
which we got rubber
Aquifoliaceae is followed
by Celastraceae, its Evidently
Connected

Amarillidaceae / Amaryllidaceae
4 Genera old name
1 perennial herbs, or vines
Leaves very narrow to widely
dilated
New name - Smalls bk
7 genus 14 sp Leucojaceae, Amaryllis
9 species Crinum was
the species we got rubber from
I think - see Record
Agave century plant
is in this family
study it more

Sapotaceae

Sapodilla family Got Rubber
we got rubber from Bumelia
Feby 10/28

Bumelia is a Buckthorn
Shrubs or trees, sometimes
thorn armed usually has
milky sap, blades densely
Nerved
Nearly all are trees
some grow in Georgia
many in Fla

Terminaliaceae
White Mangrove family
shrubs or trees, or vines
in tropical regions
4 genus
Got one with rubber today
Conocarpus erecta I think
grows up 60ft it grows
also as a shrub,
Conocarpus is a Maritime
Shrub or Tree, Small says
there is large growth of it.

Note 2 lbs ~~[illegible]~~ —
at ~~8~~ in the Vapor of
Ethylene dichl to swell it
then pass, a cheap solvent
thru to dissolve rubber —
Distill off the Dichlorethylene
& save it, then distill off
the Cheap solvent to
a sheet of rubber

This will reduce amount of
Dichlorethylene to a mere
Bagatelle — Cheap solvent
not to boil higher than
200, preferably less —

Diameter of Latex tubes in
the Hevea 1/1200 + 1/500
of inch There are projections
from the cell walls which impede
seriously the flow of latex

Note
Think water should be forced
into the latex system so it is
diluted making it free running
Its too thick even in Hevea
Ceara tree is much worse

Tubes are elliptical, sizes
increase from Cambium outward
7 to 10 microns in dia
yield of latex appears to depend
on size of tubes

~~A constant thickness of untapped~~
~~bark next the Cambium if~~
~~left when possible of a thickness~~
~~of 1.5 Millimeter 58/1000~~
~~nearly 1/16th of inch~~

~~Feby 17/28~~

Where we get a very sticky
viscous stuff we can redissolve
make a varnish + paint on
Nickel sheets or Screen plates
both sides to prevent it
drawing together + purify
by Alkalies Soda Etc
This will work very rapid
+ do it perfectly

~~Feby 17/28~~

~~It may be that ground dried~~
~~leaves brought in Vapor of a~~
~~rubber swelling or semi-~~
~~solvent get so loaded with~~
~~rubber especially a very~~
~~heavy Sp. gravity load up~~
~~with rubber by absorption~~
~~+ swelling that it would~~
~~drop by gravity removing~~
~~all the rubber in a convenient~~
~~shape requiring very small~~
~~quantity solvent,~~
~~all in Vapor~~

Oleander

9 Bushes parallel
with Laboratory

No 1	.69%	Red flowe
2	.38	
3	—	Stripped 1.10%
4	1.11	Red flower
5	1.25	
6	.73	Red flower
7	.58	
8	.21	Later no Rubber

Weight of 1 Cubic inch
20 mesh Oleander
2 lb Lot
6.668
Bush No 3

Feby 26/28

Flotation Expts

Use test tube and a pinch of
sized Oleander leaf powder
Thro 70 on 80.
put one drop of Benzol
& shake, then if nothing
floats try 2 drops & so on
Try Ether, Benzol, Bisulfide
Carbon, Chloroform
Oil pine needles, gasolene
Pet Ether, essential oils –
& other things –. also try
Ethylene dichloride. Try cold
& hot water Shake to form
an emulsion –

Try also in test Tube
Water (distilled) and heavy
Salt sol S gravity of
2.2 or more
Chl Calcium, Acetate Soda
Chlorate K or Na
Chloride Mg, get others

from the books use Test
tubes, hot & also cold

Also treat with Acetone
previous to putting in water

Pick old leaves off plants
(2) growing with the
Madagascarensis at front
stoop, for herbarium &
test, one gives Eucomia
Elastic fibres when
pulled apart

Walter Archer to pick
all old leaves from
4 Evonymus japonica

Also prune top from
4 of same - Run thru
as Edison Special

Try leaves of white
Sapota at Laboratory

Speak to Benny to hurry
the herbarium we are
400 short already
Mch 8/28 Bennys wife done | 400
375 short still from Camp Collection
See if there are Oleanders
across Road if so prune
one down square across
as a machine would do
it in practice, Did this -
Cut it square off
See Benny about the
Oleanders, on Moss garden
road, - poor on .20%
Rubber
See Jonas seed planting

Also about sprouting

50 Manihot Glasovii

in pots or otherwise to set out

Joe to tap. Moreton bay fig
+ other fig back of Altimira

go deeper in Altissima NG

Tap Ficus Elastica

See Ficus Repens at
Royal palm hotel. Vine

Perhaps instead of trying
to float the Oleander
particles containing Rubber
we use high spec. g
liquid to just float
particles having no
Rubber + by use of
Ethylene dichl we
absorb it in the rubber

Feby 27/28

+ make it heavier so it
sinks.

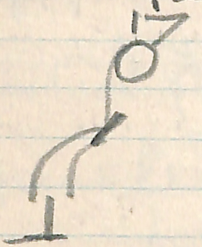
Joe + Fred to tap Hoyer
Ficus – various depths +
places – get Hoyers
permission

possibly sized granules
of Oleander may if moist
float on Ethylene Dichl
but if rubber in certain
granules will absorb
Dich + sink, perhap
shaken with water

Feby 27/28

Continuing Diehl

Think bouncing might work if Oleander particles are treated with vapor of [illegible] + fed by roller feed



or they might cling to a cylinder + those having rubber cling while no rubber particles would not + fall off.

Bignoniaceae

Flame Vine, Bignonia

that has 5.90%

pfd - rubber - pfd again

5.83 pfd 3rd 4.63

Name of Vine is

"Pyrostegia Venusta"

71.1% water in leaves

Feby 27

Pruned an Oleander in old garden - took about a ft off. 4 lbs 10 1/2 oz leaves

Total wt 7 lbs 2 1/2 oz

Stem 2 3/4 lbs

This would be 7935 lbs leaves per acre

1.78 tons dry

~~I cut it 3 ft up that was~~
~~unnecessary high, easy to~~
~~get 2 $\frac{1}{4}$ to 2 $\frac{1}{2}$ tons~~
~~If grown in small bushes~~
~~think 3 to 3.75 tons -~~

~~No 1 Bed to right 10 min~~

~~~~[illegible]~~ but left~~

~~was running 1/2 c~~

~~Now Right is cut~~

~~off & left is getting~~

~~it left finished 5~~

~~min –~~

~~Now 2nd bed right~~
~~~~

~~See family of name of~~
~~Streatch Berry~~
~~Think Small said it~~
~~was Smilax.~~

~~Jnl Washington~~
~~Academy Science~~
~~Pittier~~
~~Studies of Venezuelan~~
~~Bignonias~~
~~18 p 66 Illustrated~~
~~F 4 1928 No 3~~
~~Ceratophytum~~
~~a new genus of~~
~~Vines~~
~~C - Brachycarpum~~
~~C - Capricorne~~

~~Mch 5/28~~
~~For purifying use screen~~
~~+ Carbonate soda~~
~~Borax NG~~
~~Chloride Ammonia + Utty~~
~~Boil in H_2O 12 hours~~
~~on screen — NG~~

~~Use screen + Pet Ether~~
~~reverse Condenser~~
~~mix of Ether & water~~
~~60 E 40 H_2O 80 E 20~~
~~water 90 E 10 water~~
~~Mix Ether Pet Ether +~~
~~Water — 20%.~~ ~~[illegible]~~

~~Use larger screen +~~
~~spread out thinner~~

~~Boil ½ hour original~~
~~powder that produces~~
~~Sticky viscous stuff~~
~~wash free then Exhaust~~

in Soxhlet + Di Chlord
Req + see if sticky

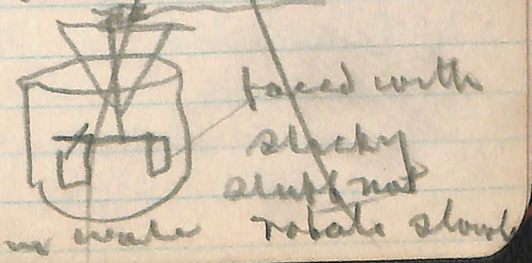
purify one lot of
Viscous stuff 8 or 10
times, Each time
repprecip'd & use new
Solution of H2O
sticky pt affected
the see if the Sol in
Dichl.

100 gr No 3 brush Oleander
Dry ground 20 mesh – 1000 cc H2O
Ball mill steel 15 lbs
4 hours – nothing came
to top, added salt
none came up added
1000 cc Extra nothing
Came up – added salt
nothing – Gave to Fred
Ott to boil few minutes
212° F to kill fungus
+ cover up till morning

following Dodges to get
Rubber out

#1 = greased board &
other things – sticky stuff
insol water

#2



to catch sticky Rubber particles—

#3. use gasoline & Emulsify by continuous stirring. Then Rubber will attach itself to Kerosene or Gasoline & float to top—

#4 To #3 gasoline add a little Dichlorethylene to make it more solvent

---

#5. another #3 with Benzol

~~Note Schmeder go ahead with stems & works all them up. Leaves dont appear promising for Ball Mill. VR~~

#6 in test tube, Oleander bush 3, use 100 cc/gasoline 50 cc—Dichloro, Soxhlet, 1st acetone then dry powder then in Soxhlet if 100 cc gasoline + 50 Dichloro works Try

#7. 125 cc gasoline + 25 cc Dichloro—

#8. Ball Mill 100 cc Oleander Bush #3— first Extract with Acetone then dry then ball Mill & then 5 lbs of flint balls— float out or use jigger w

#9 Ditto as #8 but use alcohol instead of ~~gas~~ Acetone

~~# 10 - Exhaust with Acetone dry then 1 30 cc gasoline + 20 cc dichloro, this will accumulate the whole of the Dichloro in powder then temperature will rise + gasoline will distil over + drips the soxhlet this will cool down the gasoline + Dichloro will distil over + continue till dropped again.~~

~~#11 think no success will be had with Ball Mill on leaves until powder boiled + leached. Then put in ball mill but possibly must be exhausted with Alcohol~~

~~12 - work with gasoline in which Naphthalene is dissolved try heavy in it, also Experiment with Naphthalene~~

~~Schmucks Where are the Oleander 3 of them that you redissolved + filtered + were to ball them up - Mch 8~~

~~Use some of the big Bottle Rubber dis in Kerosene + clean the dissolved Rubber by bone black + dry by Vacuum + heat, then treat the bone black Rubber gasoline for Rubber. The Kero can be eliminated by vac + heat~~

of that bone black will take
out Rubber colloid from
Gasoline, The amount of
Carbon in bone black if left in
dont hurt treat bone blk
by HCl that dissolves the
Lime & will wash out,
The Theory is that
Rubber is not dissolved
really in Kerosene but
in a semi solvent state
as colloid removable by
Bone black
Some of the new activated
Carbon might act better

In acting on plant
powder resins & Chlorophyl
must be 1st removed by
Acetone or Alcohol
dried out thoroly then
by Kerosene, if the
Rubber is to be precipd

by Alcohol, then some Napth
should be in Alcohol to
make any resin soluble
leaving only rubber to
show white

1

Try 1 Acetone 1 Kero

then see if warm if rubber
will dissolve in it.

2

Try # with Kerosene & Alcohol
& see if warm dissolves

Try powdered Lime, Ba powder
MgO - with Kerosene with
Rubber filtered clear thru
filter paper & not very strong
test it with ½ ½ Acetone &
see if it really has rubber

~~Try crushing fine various Commons inorganic Crystals. Ball Etc see if it removes rubber.~~

~~in bottle of Kerosene dissolve worm rubber to a definite amount & let it soak for 2 hours then filter test for rubber in clear filtrate~~

~~Also filter some of the strong sols of Kerosene see how amount that is really dissolved & test by alcohol Coagulation~~

~~See if a soaked Column of Mix with Kero- see if Water will displace the Kerosene up or down - put Cotton at top to prevent floating of Mix upward~~

~~The more I [illegible]~~ ~~the more~~

~~I see that in working with Rubber both dissolving & Coagulating the great necessity of working with acid free & particularly with anhydrous material~~

~~If we dissolve Hevea in Kerosene that Kero must be anhydrous~~

The acetone or alcohol
must be anhydrous
& air prevented access
to alk. - to keep water
away & ground
Absorbent must be
dried 212° -

44 x 48" ~~ft~~ area plants
Vine recumbent
we pick leaves 14 sq feet
weight after boiling 1/2
hour washing & drying
1200 100 grams
Something like 600
lbs per acre —
this kills it without can
get more foliage

Tapping expts on F-Elastic
1 drop min & 1 drop 5
min it curdles inside of
3 hours in hole ~~Think [illegible]~~
distilled water rain water
or ammonia few drops
does no good I think should
have a colloid like
Albumen gelatin etc
in water to keep all a
colloid — Water seems
to act as a ~~coll~~ acid
perhaps Mg hydroxide
might do — needs little

a little Mg OH added to
a little water in fixed
part might do the big
& get rid of tank
just enough water to
dilute the latex

Make MgO in test tube full
water + drop few drops
F-Elastica latex in
+ a check test tube without
$MgOH$ see if both curdle
turns sol greatly diluted yellow

Try Gelatin, sugar
albumin, Si etc
till get sol that will
not curdle,

Try other things than
acetone, alcohol
Not dissolving rubber
that dissolves chlorophyl

The muck from Okeechobee
Could be pumped + pipe
lined over large areas
say 1½" thick + plowed
in cement troughs
might be cheaper
once plowed in Rain
would not wash it back
it would not firm
This is true all over
South where there is
Charcoal peat pipes
Could be moved just
laid on ground
This would create
great areas for truck
farming - + be cheap
Tractor plowing it in
as fast as spread

Try sol of Hevea in
Kerosene - add 3% $NaOH$
in alcohol, Reflux Condr
hot, see if purifies
Syphon off Kerosene
Also filter Kero with
Rubber through powder
$NaOH$ warm

~~possibly alcoholic 3% NaOH~~
~~will precipitate Rubber from~~
~~Kerosene or Acetone with~~
~~NaOH in/ + same time~~
~~will purify it,~~

~~Try distilling off Gasolene~~
~~from a Gasoline Rubber Sol~~
~~which took up cold all~~
~~the rubber it would dissolve~~
~~+ this Sol filtered its a~~
~~pretty good solvent as~~
~~Compared to Kerosene~~
~~The Sol could be distilled~~
~~off in Vacuo - then then~~
~~perhaps precipitated by~~
~~something of much lower~~
~~or higher B P so precipitate~~
~~Sol could be recovered~~

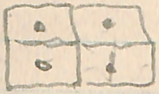
~~proper Sol would be one~~
~~that has no action on~~
~~Rubber in Vials & should~~
~~be sol in Gasolene cheap~~

Madgascarensis

16-ft | 42,000 | 2625
32
100
96
40
32
80

16 ft sq

2625 plants to acre



Weight of wet fresh leaves —
4 lbs - 1855 grams
Weight of stems ——
As there was 2 plants
this makes 2625 plants
5250 lbs per acre of
wet leaves

Madgascarensis —
Cut off 2 ft from ground
last May 1927
gives 5250 lbs of leaves
wet per acre

plant 2 years old
from pot plant —
Now drying leaves —

42000	35000	1/16
	2 / 17500	1/8
	8750	1/4
	4375	1/2
	2180	1
	1090	2
	545	4
	272	8

3 / 6800

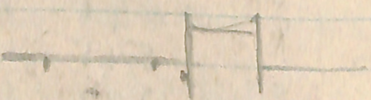
Centigrade lengths

MM	0·039	39/1000	39/1000
CM	·393	393/1000	$\frac{1}{4}$"
DM	3·937	3" 937/1000	4"

1·69
1 69
2·85 inch sq
3 2 1
1 4
1 0
1 6 9 6
2·8 5 1

1·285) 50000 (17·5
285
2150
1995
1550
1

3 –



55
9
495
99
32
131

5) 495) 71200 (35 tons
6000
11200

16) 42000 (2666
32
100
96
100
1

3.20 pr

2660
15
13300
2660
39900
40
480

12" 36"

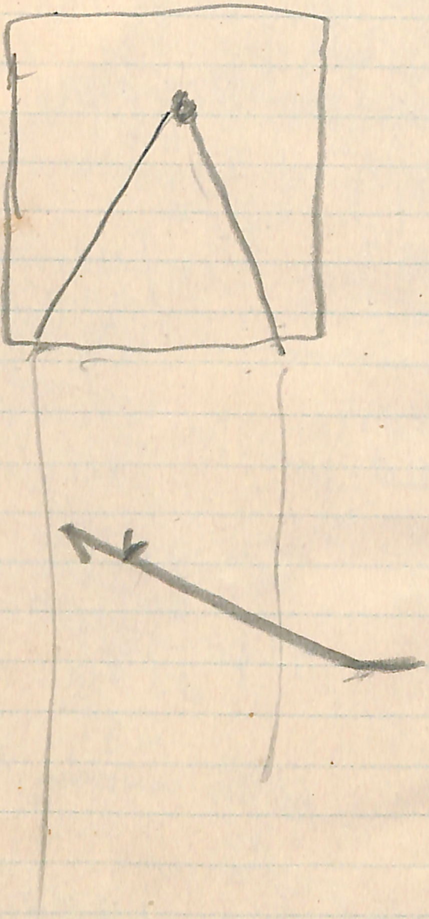
40 ft

480 inches high
36
2880
1440
17280

17000 inches

450) 40000 (900
4050
9500

M
C
D



M 24

Cryst — M 14 bag 1.21%
grilled glass

M 29

28 lbs Cubic ft

4 Cubic ft. to 100 lbs

15
15 2
75
15
225 1 ft high
2 ft diameter